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# Some Remarks Further to *Outer Space and International Geography: Article II and the Shape of Global Order* by P.J. Blount

FRANS VON DER DUNK\*

## INTRODUCTION

This should by no means be read as a request for commiseration, but as someone making a living with not only teaching and researching but also consulting on space law, I often face a certain gut-level misapprehension and mistrust of "the law" on the part of non-lawyers from all sorts of other space-related disciplines. We are viewed as trouble-makers, game-spoilers who point out to scientists and engineers that their wonderful ideas and projects will likely give rise to important legal consequences and tell entrepreneurs who risk their money and their lives for the benefit of all humankind that they first need a license.

In particular, in the U.S. commercial sector, I daresay, time and again claims can be heard that law and regulation is only stifling the progress of the human race and human societies, that the less there is of law and regulation, the better. Specifically with a view to commercial space endeavors, of which the thrust for space mining is only the most recent manifestation, the U.S. government is regularly urged to step out of the Outer Space Treaty,<sup>1</sup> presumably hindering the full deployment of private enterprise's brains and brawn to develop new and exciting services and markets.<sup>2</sup>

It would be quite enlightening for such regulation-bashers to have a look

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<sup>1</sup> See generally Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, D.C.-London-Moscow, January 27, 1967, T.I.A.S. No. 6347, 18 U.S.T. 2410 [hereinafter Outer Space Treaty].

<sup>2</sup> See generally Henry R. Hertzfeld & Frans von der Dunk, *Bringing Space Law into the Commercial World: Property Rights without Sovereignty*, 6 CHI. J. INT'L L. 81 (2005).

at what happened in the Netherlands a few years ago. The Dutch national space law of 2007,<sup>3</sup> establishing a licensing system for private space activities, had not been made applicable to small satellites as these were not “guided” in outer space.<sup>4</sup> When a few years later a Dutch company entered the market for piggy-back launches of small satellites not further guided in outer space, this omission was restored—not on the initiative of the Dutch government itself, but upon the insistence of the private company at issue.<sup>5</sup> The company realized that only in that way they could both judge their business and liability risks much more precisely, and create a much higher level of trust with the validity and legitimacy of their business operations. After all, they now operated under licenses granted by the Dutch government which was thereby also committed to defend the interests of the company in the international arena.

Likewise, also P.J. Blount’s article, *Outer Space and International Geography: Article II and the Shape of Global Order*, makes clear once more that the simplistic view of regulation as being bad for private enterprise is, if not simply misguided and mistaken, at least grossly lopsided and failing to recognize certain realities in the real world out there. This, again, also when it comes to space mining.

Article II reads in full: “Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”<sup>6</sup> Blount provides a thoughtful, balanced, and comprehensive analysis of this Article, one of the key provisions of the Outer Space Treaty,<sup>7</sup> and what it means for such projects as those aiming to mine asteroids for commercial gain. This analysis should be mandatory reading for everyone involved in such developments, whether as entrepreneur, criticaster, political commentator, concerned member of the general public, or potential regulator and legislator. It provides sufficient substance to the argument that even in the United States it is better for a private company – at least, if it has bona fide intentions – to work within a legal framework of some substance as it also ensures that the country itself has something at stake, both legally and otherwise.

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<sup>3</sup> Law Incorporating Rules Concerning Space Activities and the Establishment of a Registry of Space Objects, January 24, 2007, *Stb.* 2007, 80 (for English version, see <https://perma.cc/4RZ3-3JEX>) [hereafter Dutch National Space Law]; CHRISTIAN BRUNNER & EDITH WALTER, *NATIONALES WELTRAUMRECHT / NATIONAL SPACE LAW* 201 (2008).

<sup>4</sup> Dutch National Space Law, *supra* note 3, §§ 1(b), 2(1), 3(1).

<sup>5</sup> See TANJA MASSON-ZWAAN, *Registration of Small Satellites and the Case of the Netherlands*, in *SMALL SATELLITES* 174, 174–94 (Irmgard Marboe, ed., 2016).

<sup>6</sup> Outer Space Treaty, *supra* note 1, art. II.

<sup>7</sup> See STEVEN FREELAND & RAM JAKHU, *Article II*, in 1 *COLOGNE COMMENTARY ON SPACE LAW* 44–63 (Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogel, eds., 2009).

## THE KEY ROLE OF ARTICLE II OF THE OUTER SPACE TREATY

What precisely is at stake here, then? Blount helpfully frames it as the establishment of a new “international geography” over a long period starting as early as the Peace of Westphalia of 1648<sup>8</sup> and culminating in the immediate aftermath of the Second World War with the creation of the United Nations,<sup>9</sup> determining the legal status of all the various areas potentially subject to human activity, and hence to potential disputes, perhaps even wars. As for the area of outer space specifically, when this came to be included into the realm of human activity in the late 1950s it had to be logically integrated into this “international geography.” Thus, in the Outer Space Treaty of 1967 a key provision was included regarding (the absence of) territorial sovereignty in outer space which took the shape of Article II.

Most importantly, the Treaty including this clause was agreed upon by both the United States and the Soviet Union. While they were the two super and space powers of the day, and as such locked in a space race as well as in a Cold War more broadly speaking, both desired to prevent any land grab in outer space reminiscent of the colonization-era back on Earth. The legal concept of *terra nullius*, no man’s land that was however susceptible to becoming some state or other’s land further to certain conditions being fulfilled,<sup>10</sup> was no longer seen as a viable one for outer space; either the concept of *terra communis* (in the context of the Outer Space Treaty most prominently referenced by the notion of “province of all mankind”)<sup>11</sup> or perhaps even a stronger version thereof labelled “common heritage of mankind”<sup>12</sup> should be made to apply to the area, as proposed by the Moon

<sup>8</sup> The Treaty of Peace between Spain and the United Provinces of the Netherlands, Münster, May 14, 1648; The Treaty of Peace Between France and the Holy Roman Empire, Münster, Jan. 1649; The Treaty of Osnabrück: Treaty of Peace between the Holy Roman Empire and Sweden, Münster, Jan. 1649.

<sup>9</sup> See generally Charter of the United Nations and Statute of the International Court of Justice, June 26, 1945, U.S.T.S. 993, 24 U.S.T. 2225 [hereinafter UN Charter].

<sup>10</sup> See, e.g., REBECCA M.M. WALLACE, INTERNATIONAL LAW 93–100 (3d ed. 1997); GIDEON BOAS, PUBLIC INTERNATIONAL LAW 181–90 (2012).

<sup>11</sup> Outer Space Treaty, *supra* note 1, art. I (sticking the label of “province of all mankind” to the use and exploration of outer space rather than to outer space as an area, but the result is that the area legally speaking very much comes to resemble the concept of *terra communis*—which on Earth most famously stuck to the high seas, just like “outer space” not “terra” in the literal sense of the word); see also STEPHAN HOBE, *Article I*, in 1 COLOGNE COMMENTARY ON SPACE LAW 25–43 (Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, eds., 2009).

<sup>12</sup> Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 1363 U.N.T.S. 3, 18 I.L.M. 1434 (entered into force July 11, 1984) (introducing the concept of the “common heritage of mankind” itself, although unfortunately some States and experts tried to claim that “province of all mankind” and “common heritage of mankind”

Agreement.<sup>13</sup>

This is where Blount's piece makes it clear how important it is to be aware of the fine lines between sovereignty and ownership, between the international need for some clarity on the status of certain areas versus the private desire to own something for the sake of exploiting it. In other words, how important it is to argue accurately and expertly rather than generally and broadly, and how important it is to know where certain legal rules come from, historically speaking, and what they were supposed to address as compared to what they are now called upon to address, with often confusing and sometimes backfiring results.

As for the concept of territorial sovereignty,<sup>14</sup> from roughly the fifteenth through the nineteenth century claiming new national territories had been very much a (Western) European habit applied to non-European parts of the world. In their arrogance, these European countries equated territories populated by non-European peoples to wild and uncivilized territories, which presumably legitimized them in taking over control. In particular, the Portuguese, the Spanish, the Dutch, the French and the English created huge colonial empires in that manner. And while their attitude was very Europe-centric, the legal notion that planting a flag was an act of establishing sovereignty quickly stuck and became accepted worldwide as part and parcel of the law of nations.

By 1967, the year of birth of the Outer Space Treaty, the process of decolonization not only had largely destroyed any notion of the legality of such colonization,<sup>15</sup> but colonization itself was also considered responsible for tremendous human suffering and for many armed conflicts that had raged over the centuries. The United States and the Soviet Union were determined not to repeat that mistake of the old European colonial powers when it came to decide on the legal status of outer space.

As Blount's article makes very clear, the result was Article II, precisely worded for the purpose; and apparently it served that purpose well, for even when the Apollo missions in 1969 through 1972 planted several U.S. flags on the Moon, the United States made very sure that no one would misinterpret such ceremonial actions as claims of sovereignty, and no serious doubt was

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essentially amounted to the same, considerably blurring the discussion and the substantial differences between the two concepts) [hereinafter Moon Agreement]; see also FRANS VON DER DUNK, *International Space Law*, in HANDBOOK OF SPACE LAW 99, 101–03 (Frans von der Dunk & Fabio Tronchetti eds., 2015).

<sup>13</sup> See, e.g., von der Dunk, *supra* note 12, at 55–60.

<sup>14</sup> See BOAS, *supra* note 10, at 180–94.

<sup>15</sup> See, e.g., BOAS, *supra* note 10, at 194–204; see also ANTONIO CASSESE, *INTERNATIONAL LAW* 105–08 (2001); MICHAEL AKEHURST, *A MODERN INTRODUCTION TO INTERNATIONAL LAW* ch. 19 (7th ed. 1997).

raised by other nations or other parts of the world community to U.S. intentions in this regard.

## ARTICLE II OF THE OUTER SPACE TREATY AND THE COMMERCIALIZATION OF OUTER SPACE

Space activities, however, constitute a realm where developments can go very fast. Back in 1967, few predicted—let alone were concerned with—the potential for privately-driven commercial space activities, apart from satellite communications. As Blount also briefly addresses, Article VI of the Outer Space Treaty, making states internationally responsible for activities of non-governmental entities and requiring them to authorize and supervise them, was the closest the drafters of the Treaty came to addressing any potential future involvement of the private sector in outer space activities.<sup>16</sup>

Even as for satellite communications, moreover, commercialization and privatization were far from self-evident. It was illustrative that even the United States, the leading free-market economy and its most outspoken political supporter, by statute established ComSat,<sup>17</sup> a government-driven consortium with a legitimized monopoly position, to develop a healthy satellite communications infrastructure rather than leave it to the private sector to do so. Only with the appearance on the market in the early 1980s of private satellite communication operators such as PanAmSat and OrionSat in the United States and SES in Europe, did something like a private commercial satellite communication sector begin to develop. This ultimately gave rise to the privatization of the major international satellite service providers INTELSAT, INMARSAT and EUTELSAT in the early 2000s,<sup>18</sup> legally buttressed by the 2000 ORBIT Act in the United States<sup>19</sup> and the 1994 Satellite Directive in the European Union.<sup>20</sup>

So when less than a decade ago the first serious plans were hatched by

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<sup>16</sup> See, e.g., VON DER DUNK *supra* note 12, at 45–55; M. GERHARD, *Article VI*, in 1 COLOGNE COMMENTARY ON SPACE LAW 25–43 (Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl eds., 2009).

<sup>17</sup> See *generally* Communications Satellite Act of 1962, H.R. 11040, 87th Cong. § 102 (1962); 1 INSTITUTE OF AIR AND SPACE LAW AT COLOGNE U., SPACE LAW: BASIC LEGAL DOCUMENTS (Karl-Heinz Bockstiegel, et al., eds., 2005).

<sup>18</sup> See also VON DER DUNK, *supra* note 12, at 282–301; see *generally* PATRICIA MCCORMICK & MAURY MECHANICK, THE TRANSFORMATION OF INTERGOVERNMENTAL SATELLITE ORGANISATIONS (2013).

<sup>19</sup> Open-Market Reorganization for the Betterment of International Telecommunications Act, H.R. 3261, 106th Cong. § 2 (2000).

<sup>20</sup> See *generally* Commission Directive Amending Directive 88/301/EEC and Directive 90/388/EEC in Particular with Regard to Satellite Communications, 94/46/EC, of 13 October 1994, OJ L 268, 18.10.1994, p. 15.

the private sector to target asteroids for mining their mineral resources for commercial gain, it became evident that neither Article II nor any other part of the Outer Space Treaty or international space law at large was able to address the specific legal parameters for and ramifications of such activities.

This in fact allowed those now having something at stake to try and give the legal discussion their own twist. This ranged all the way from declaring that since Article II spoke of national appropriation it did not prohibit private appropriation (by such entrepreneurs as Dennis Hope and his Lunar Embassy) to clamouring for denunciation of the Treaty (by some other entrepreneurs who claimed that this clause effectively killed any private initiative in the realm) respectively claiming that only a detailed international regime would be able to legitimize private mining activities (by some countries who would like to see the Moon and other celestial bodies qualify as the “common heritage of mankind”).

And that is also why Blount’s scholarly, detailed, balanced and non-partisan analysis is so important. Laying bare the complex relationship between territory and private property rights, he accurately debunks the sly reading of the prohibition on national appropriation as allowing for private appropriation, the basis for the claims of Lunar Embassy and their ilk. He carefully deconstructs the claimed relevance of denouncing the Outer Space Treaty, as the provisions of Article II form part of a much broader and more generally accepted set of principles constituting customary international law anyway. Finally, he firmly disarms any politically-charged ideas that commercial exploitation would only be possible subject to an international regime of a presumably all-encompassing character—he even unveils that the most vociferous proponent of these ideas has itself sold lunar dust without seeking or receiving consent of the rest of the world.

The distinctions elaborated on as between “territory” in outer space and material resources out there, and between “sovereignty” and “property,” effectively dismantles all these extreme positions. They clarify that (1) the Moon and other celestial bodies cannot be legally treated as the backwaters of any particular country, allowing the principled freedom of every state to go there (or allow its citizens to go there) to rule supreme;<sup>21</sup> (2) such freedom is only limited by rules of international law such as the ones addressing harmful interference and the requirements of authorization and continuing supervision;<sup>22</sup> (3) within the boundaries of the two previous points commercial mining should be allowed;<sup>23</sup> (4) that such commercial mining

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<sup>21</sup> See generally Outer Space Treaty, *supra* note 1, art. I (stating the fundamental freedom for all States to use and explore outer space, meaning that in principle only at an international level any limitations to such freedom can be discerned or established).

<sup>22</sup> See Outer Space Treaty, *supra* note 1, arts. IX, VI.

<sup>23</sup> See FABIO TRONCHETTI, *Legal Aspects of Space Resource Utilization*, in HANDBOOK OF SPACE

would not necessarily be subject to a regime akin to that originally envisaged by the United Nations Convention on the Law of the Sea;<sup>24</sup> and (5) new rules would be required following some key principles of the Outer Space Treaty and international space law more broadly speaking to protect the interests of third parties and humankind at large.<sup>25</sup>

This means neither that Lunar Embassy can claim title to (sur)real estate on the Moon or other celestial bodies,<sup>26</sup> nor that there is a need for a state to step out from the Outer Space Treaty in order to allow its citizens to start commercial mining operations, provided they comply with relevant existing and future rules of international law.<sup>27</sup>

### SPACE MINING: THE NEED FOR AN UPDATE OF THE LEGAL FRAMEWORK

That is not to say that current space law could not do with a helpful update in particular with regard to the issue of space mining – as Blount correctly surmises, probably the main reason why the discussion on Article II of the Outer Space Treaty and what it is supposed to mean is so prominently back on the table these days.

Blount himself respectfully refrains from providing unequivocal statements in that respect, and obviously it is true that ultimately the states of the world, in line with the baseline freedom of space activities posited by Article I of the Outer Space Treaty, would have to decide on what updates would be desirable and would make most sense.

Nevertheless, if the conclusion would indeed be that Article II does not in principle stand in the way of space mining activities even if licensed by a single state (as opposed to what the United Nations Convention on the Law of the Sea had established for deep seabed exploitation activities), as Blount convincingly argues with respect to the recent U.S.<sup>28</sup> and Luxembourgish<sup>29</sup>

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LAW 769, 769–813 (Frans von der Dunk & Fabio Tronchetti, eds., 2015).

<sup>24</sup> United Nations Convention on the Law of the Sea, arts. 133–191, Dec. 10, 1982, 1833 U.N.T.S. 3 (entered into force Nov. 16, 1994) (providing for an *international* licensing regime applicable to mining the deep seabed pursuant to declaring that area to be the “common heritage of mankind”); *see also* TRONCHETTI, *supra* note 23, at 792–98.

<sup>25</sup> *See* Outer Space Treaty, *supra* note 1, art. VII; Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T 2389, 961 U.N.T.S. 187 (entered into force Sept. 1, 1972).

<sup>26</sup> *See, e.g.,* Von der Dunk et. al., *Surreal Estate: Addressing the Issue of “Immovable Property Rights on the Moon,”* 57 SPACE, CYBER, AND TELECOMM. L. PROGRAM FAC. PUBL’NS 149 (2004).

<sup>27</sup> *See* Hertzfeld, *supra* note 2, at 94.

<sup>28</sup> *See generally* U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, 129 Stat. 704, 705 (2015) (Title IV addresses space mining).

<sup>29</sup> *Loi du 20 juillet 2017 sur l’exploration et l’utilisation des ressources de l’espace*, art. 1, LE

laws, it would be interesting to pursue this line of thought a little further.

I have regularly made the comparison between the high seas (as opposed to the deep seabed) and the realm of outer space, in the sense that both would qualify as a “global commons,” a “province of all mankind” available to all states within the realm of international law.<sup>30</sup> The default consequence of that status for the high seas has always been that, while not “appropriable” by states in any sovereignty- or territory-related sense,<sup>31</sup> its living resources can be harvested (and thus legitimately owned and sold for profit) by individuals and individual companies from every state<sup>32</sup>—precisely the distinction that Blount’s sharp analysis also makes.

While the consequence of the comparison of “outer space resources” with “high seas resources” obviously would lead to a full-fledged legality of space mining within the limits indicated above as to compliance with applicable international law, the comparison is not without its problems.

First, an argument could be made that the resources of the high seas at issue are living resources, that is self-reproductive and autonomously mobile, whereas the resources targeted by space miners are perhaps very mobile but propelled by laws of physics which brook no deviations, and certainly not reproductive in any normal sense of the word. Careful management of living resources would allow them to be qualified as renewable, non-exhaustible resources, whereas by definition non-living resources are exhaustible and non-renewable. Should that not warn against too easily equating the two scenarios?

However, upon closer view, what matters under applicable law—at least so far—is not so much their nature (living versus non-living) but their value as economic commodities. While humans have granted living economic commodities certain rights, often by law (at least if enjoying some level of animal intelligence and development) such as to non-cruel treatment as compared to non-living commodities; that has never stood in the way of cattle, birds, and fish being owned and sold for profit as products, as a whole or in pieces. It is noteworthy that also the United Nations Convention on the

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GOUVERNEMENT DU GRAND-DUCHÉ DE LUX., <https://perma.cc/558C-FH2N> (last visited Sept. 7, 2019) (law on the exploration and utilization of space resources).

<sup>30</sup> See generally, e.g., Frans von der Dunk, *Asteroid Mining: International and National Legal Aspects*, 26 MICH. ST. U.-DCL J. INT’L L. 83, 101 (2017).

<sup>31</sup> United Nations Convention on the Law of the Sea, *supra* note 24, art. 89 (“No State may validly purport to subject any part of the high seas to its sovereignty.”).

<sup>32</sup> Cf. United Nations Convention on the Law of the Sea, *supra* note 24, art. 87(1)(e), (2) (providing for the freedom of fishing subject to “due regard for the interests of other States in their exercise of the freedom of the high seas, and also with due regard for the rights under this Convention with respect to activities in the Area,” which includes of course due regard for international obligations stemming from other treaties such as related to overfishing, the prohibition on whaling, rules on marine pollution and suchlike).

Law of the Sea includes within the freedoms of the high seas the freedoms to lay submarine cables and pipelines and to construct artificial islands and other installations permitted under international law<sup>33</sup>—the general idea clearly was to encompass all economic, exploitative uses of the area.

Conversely, the United Nations Convention on the Law of the Sea recognized the renewable nature of living resources largely by addressing the actual threats to such renewability: states are to cooperate in the conservation and management of those living resources<sup>34</sup> as well as impose relevant obligations upon their own nationals to comply with related international measures.<sup>35</sup> To some extent—namely, as far as the international community of states would be willing to agree to—later treaties would then further elaborate on such measures by focusing on over-fishing of certain fish stocks<sup>36</sup> or addressing marine pollution partly because of its threats to the living resources.<sup>37</sup>

This also aligns with Blount's analysis on the differentiation between the prohibition of appropriation of outer space and its celestial bodies as mainly driven by political considerations (notably the fear of land-grabbing in outer space giving rise to state-to-state conflicts, possibly escalating into armed conflicts) and the considerations regarding private ownership, which are of a fundamentally economic nature and importance.

Therefore, at the highest level the comparison should still hold, even if at a lower level the differences between fish as living resources and minerals as non-living resources may need to be heeded. Ultimately, if we allow by law the private ownership of live resources with a certain level of consciousness and intelligence, there would not be a single principled reason for not allowing private ownership of non-living resources.

A second flaw in the comparison goes to the nature of the activities necessary for economic exploitation. Simply put: the moment a fisherman catches sight of a certain substantive amount of fish that would be available for catching, normally he is able to immediately start the harvesting process. Even if more sophisticated tools are used—general analytical information about fertile fishing grounds mixed with own experience, maybe even

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<sup>33</sup> United Nations Convention on the Law of the Sea, *supra* note 24, art. 87(1)(c)–(d).

<sup>34</sup> United Nations Convention on the Law of the Sea, *supra* note 24, art. 118–119.

<sup>35</sup> United Nations Convention on the Law of the Sea, *supra* note 24, art. 117.

<sup>36</sup> *See, e.g.*, Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, Aug. 4, 1995, T.I.A.S. No. 01-1211, 2167 U.N.T.S. 3 (entered into force Dec. 11, 2001) [hereinafter Fish Stocks Agreement].

<sup>37</sup> *See, e.g.*, International Convention for the Prevention of Pollution From Ships, Nov. 2, 1973, 1340 U.N.T.S. 61 (entered into force Oct. 2, 1983) [hereinafter International Ship Convention].

satellite information gathered—it would usually be a matter of a few days, or at best weeks, before the fisherman is present in the catchment area and able to start using his nets. Cost-wise, we would probably be speaking of operations in the range of no more than a few hundreds of thousands, perhaps a few millions of dollars overall.

By contrast, picture an asteroid mining company aiming for a particular asteroid by way of a mining operation. It first needs to find potentially interesting asteroids, likely looking out for them as far away as the asteroid belt between Mars and Jupiter—some 300,000,000 miles or more from Earth. Once it finds a few interesting ones, likely reconnoitering missions would have to be developed, built, launched and flown, in order to allow close-up inspection: is the asteroid at all worth going there? If so, what are its characteristics? How should actual mining operations be tackled? Presumably only then would the company initiate the actual mining mission—most likely years, maybe even decades as well as hundreds of millions of dollars if not more after the first major decisions taken.

The difference in time-scales and dollar-scales means that while a fisherman runs relatively little risk of being outsprinted to the lucrative catchment area (and even if he would be, he would suffer relatively surmountable losses) the mining company runs serious risks of being overtaken<sup>38</sup>—and may be financially destroyed as a consequence. Thus, in particular the industry itself would benefit hugely from an update to the current, vague, and non-distinctive set of principles applicable to space mining, presuming it at least provides substantial guarantees against such pirating activities.

By way of a third major comparative issue, fishing on the high seas has taken place by now for millennia, which also meant that a considerable body of international law has developed taking care of the general public interests potentially threatened by commercial exploitation for private gain. The United Convention on the Law of the Sea already provides a number of further limitations to the baseline freedom of the high seas, for instance, when it comes to peaceful uses.<sup>39</sup> In addition, a host of treaties has been developed to impose further prohibitions, obligations and requirements limiting the freedom, such as the aforementioned ones on overfishing<sup>40</sup> and marine pollution.<sup>41</sup>

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<sup>38</sup> Outer Space Treaty, *supra* note 1, art. XI (requiring states to regularly inform each other and the UN Secretary-General of their space activities and results, in particular scientific results—and reconnoitering missions to asteroids, even if for ultimately exploitative purposes, may well provide a number of interesting scientific insights as well).

<sup>39</sup> *E.g.*, United Nations Convention on the Law of the Sea, *supra* note 24, art. 88.

<sup>40</sup> *See* Fish Stocks Agreement, *supra* note 36, at 4.

<sup>41</sup> *See* International Ship Convention, *supra*, note 37, at 61.

By contrast, the Outer Space Treaty or indeed space law as a whole offers little more beyond the current, somewhat qualified prohibition on harmful interference of Article IX.<sup>42</sup> This is precisely why Blount's call for further discussion of what the appropriate public safeguards to private exploitation should be, once agreement on its legality *per se* is no longer politically challenged, and how at the same time the rights and interests of bona fide space entrepreneurs could be protected, is very much to the point. As Blount phrases it, "states should avoid a race to bottom in terms of developing legal regimes surrounding property rights and resource extraction in space by balancing the benefit of the commercial activity with the values and principles that underpin international space law."<sup>43</sup>

While it is important to be alert on possible risks to such a race to the bottom, to "cheap licensing and to hell with the consequences," in view especially of the dire experiences in the law of the sea, there are two reasons which may help space law escape too many harmful scenarios of "flags of convenience." One is legal, the other practical in nature.

Legally speaking, the beauty of international space law is the principle of state liability, meaning that the launching state(s) is/are liable for damage caused by space objects also in case these are owned, launched, and/or operated by private operators.<sup>44</sup> All such states therefore have a direct and substantial interest in ensuring that whatever private operator launches under their aegis, he is relatively unlikely to cause major accidents—since the bill, at least for international third-party damage, will have to be footed by the national treasuries. Any sloppy approach à la flags of convenience would thus immediately backfire. Many states therefore have taken the opportunity, through national space laws, to impose profound conditions upon those operators interested in undertaking the relevant space activities, and even to derogate part or all of such international third-party liability to the actual operators by way of the license.<sup>45</sup>

In addition, it is noteworthy that a cheap licensing state in the context of the law of the sea bears only a small portion of the risk of cheap licensing anyway. A ship operated under lenient conditions of a cheap flag state as to the qualifications of the captain and the crew as well as the safety measures

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<sup>42</sup> See, e.g., SERGIO MARCHISIO, *Article IX*, in 1 COLOGNE COMMENTARY ON SPACE LAW 25–43 (Stephan Hobe, et. al., eds., 2009).

<sup>43</sup> P.J. Blount, *Outer Space and International Geography: Article II and the Shape of Global Order*, 52 NEW ENG. L. REV. 95, 96 (2018).

<sup>44</sup> See Outer Space Treaty, *supra*, note 1, art. VII; Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, T.I.A.S. No. 7762, 961 U.N.T.S. 187 (entered into force Sept. 1, 1972) [hereinafter Liability Convention]; see, e.g., VON DER DUNK, *supra* note 12, at 45–55, 82–84.

<sup>45</sup> See, e.g., IRMGARD MARBOE, *National Space Law*, in HANDBOOK OF SPACE LAW 127 (Frans von der Dunk & Fabio Tronchetti, eds., 2015).

on board can cause accidents anywhere on the seas and oceans of the world. The licensing state may just have a few per cent of a chance that any disaster will spoil *his* beaches with oil or will cause *his* harbour to become non-operational for some time to come. By contrast, the launch phase of a space endeavour is still by far the most dangerous and risky part of the operation. Any failure in the realm of safety would therefore immediately backfire against the launching state, who is most likely to bear the consequences of any sloppy licensing.

### UPDATING THE EXISTING LEGAL FRAMEWORK: SOME FURTHER THOUGHTS

Once the need to update the existing legal framework is agreed upon, a major problem, unspecified and to some extent unhelpful as that existing legal framework is, immediately unveils itself: we have very little to work with—as yet no experience whatsoever with any commercial exploitation of mineral resources of celestial bodies and very little even by way of scientific governmental missions to celestial bodies.

There is just one thing we can be sure of: not only the nature of mining missions will vary hugely, but they will address celestial bodies of rather different dimensions. With such celestial bodies as the Moon and Mars, enormous pieces of floating rock, it is clear that going to them means landing on them and harvesting resources on them means some sort of digging into them—and neither of them will make any noticeable difference in their composition, orbits, or other key aspects of their existence. It does not lessen the need to consider establishing rules regarding, for instance, environmental pollution or access to facilities of other states,<sup>46</sup> but the clear distinction guiding Blount's analysis between sovereignty and property, between territory and resources, and between prohibition respectively tolerance pursuant to Article II continues to hold and serve as point of departure for any further legal development.

By contrast, relevant asteroids are much smaller in size, and actually can be as small as only a few hundreds of meters long or even less. Consequently, the distinction between landing on it and grabbing it can become blurred, any harvesting can substantially change composition and orbit of the celestial body at issue or even completely destroy it—effectively, precisely that would be the intention in many cases—and the legal distinction between sovereignty and property, between territory and resources, and between illegality and legality would become blurred as well.

There is no easy solution to this conundrum, although that should not

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<sup>46</sup> Outer Space Treaty, *supra* note 1, art. XII (requiring free access by states to all facilities on celestial bodies belonging to or operating under the jurisdiction and control of other states).

stop space lawyers from addressing it already now. It is interesting to look in this respect to the much-derided Moon Agreement, even as certain key provisions, precisely on potential commercial exploitation, ultimately caused it to fail.<sup>47</sup> The Moon Agreement also contains parts that are generally recognized as more simply reflecting and elaborating accepted principles of the Outer Space Treaty, however,<sup>48</sup> and could therefore well serve as helpful pointers in the current debate.

Thus, the Moon Agreement specifically allows for “specific legal norms [to] enter into force with respect to any . . . celestial bodies” other than the Moon itself.<sup>49</sup> Even more interestingly, the Moon Agreement speaks of “extraterrestrial materials which reach the surface of the Earth by natural means” to which the Moon Agreement by its own terms does not apply.<sup>50</sup> While the second part of the latter provision, speaking about “natural means,” makes clear that this clause was not intended for any materials to be landed on Earth by human intervention, the reference to “extraterrestrial materials” as a fundamentally different category from “celestial bodies” is interesting in the light of the above-noted conundrum.

Would there be any particular cut-off size above which we should speak of a celestial body which you cannot own but upon which you can land and then, presumably, harvest its resources whereas below that threshold we should rather address it as extraterrestrial materials where grabbing rather than landing would be the operative verb, where the distinction between territory and resources, between sovereignty and property, and hence between illegality and legality, would no longer operate?

Should we, following the combined suggestion of Article 1(1) and Article 1(3), work towards a specific regime for small celestial bodies which really should qualify as extraterrestrial materials, even if the first clause (allowing for a regime separate from that of the Moon Agreement) only addresses celestial bodies and the second clause (fundamentally excluding them from application of the Moon Agreement) only addresses extraterrestrial materials?

## CONCLUDING REMARKS

Not only is there, as per Blount’s analysis, no need from a private

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<sup>47</sup> Moon Agreement, *supra* note 12 (noting that the Moon Agreement as of today enjoys the ratification of only 18 states, of which only Australia could be said to be a major spacefaring nation); see Status of International Agreements Relating to Activities in Outer Space as of 1 Jan. 2018, 57<sup>th</sup> Session, U.N.Doc. A/AC/105/C.2/2018/CRP.3 (2018).

<sup>48</sup> See, e.g., VON DER DUNK, *supra* note 12, at 101–03.

<sup>49</sup> Moon Agreement, *supra* note 12, art. 1(1).

<sup>50</sup> Moon Agreement, *supra* note 12, art. 1(3).

enterprise-perspective to get rid of the obligations of the Outer Space Treaty —reiterating that, in addition, the contents of the Outer Space Treaty are generally considered to represent customary international law, so that denouncing the Treaty *de facto* would still not relieve relevant states from relevant obligations;<sup>51</sup> it actually serves the interests of private entrepreneurs for the Outer Space Treaty to remain in force and be enforced as much as possible. Only that Treaty provides space entrepreneurs with the legitimacy of their activities *vis-à-vis* possible political or economic opponents, and it allows them to call upon their own state to defend such interests in the global politico-economic arena.

Or, to put it differently: suppose the United States would indeed denounce the Outer Space Treaty. What would then, politically speaking, keep other countries from doing the same, which over time may cause a breakdown also of the customary value of its contents so that a number of years from now not even legally speaking “harmful interference”<sup>52</sup> with their activities would be prohibited. . . ?

In particular, in the space mining context this is of major importance. Only a truly global market for the resources extracted from asteroids (whether returned to Earth, as seems the principal goal only for platinum, or used in outer space, as is likely to happen with water and most other minerals) could possibly turn this into a profitable business. If other countries from their politico-legal perspective would come to see such extracted resources as akin to blood diamonds or stolen art, in other words subject-matter of illegitimate trade, that certainly would not be very helpful.

The Outer Space Treaty, including notably its Article II, legally speaking is by far the best instrument to help convince others of the legitimacy of those operations, as long as within the boundaries of existing and future international law, and rather than feeling undercut by Blount’s article, private enterprise should embrace it as a major tool for making space mining work—for themselves as much as, ultimately, for the benefit of all humankind.

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<sup>51</sup> See Vladlen S. Vereshchetin & Gennady M. Danilenko, *Custom as a Source of International Law of Outer Space*, 13 J. SPACE L. 22, 32–33 (1985).

<sup>52</sup> Cf. Outer Space Treaty, *supra* note 1, art. IX. See generally TRONCHETTI, *supra* note 23, at 778, 782–92 (discussing the general impact of the Moon Agreement and the Outer Space Treaty relative to the legal controversies surrounding the exploitation of extraterrestrial resources).